REMARKS

Claims 1-12 remain pending in the above-identified application and currently stand rejected following the Official action of 15 August 2008. In preparing this response, applicants noticed a missing semicolon in claim 12 and have now amended that claim to correct that error.

Before proceeding to address the rejections of the claims, applicants will briefly summarize their invention to assist the examiner in better appreciating the differences between applicants' invention and the art of record. As recited in claim 1, applicants' have invented a new technique for modeling film grain patterns. Applicants' technique commences by first transforming into the frequency domain a set of film grain samples, representing at least one group of neighboring pixels that retain information about the size and shape of film grain patterns. The coefficients that result from such a transform undergo storage. Analysis of the pattern associated with the stored coefficients occurs an estimation is made of the cut frequencies of a 2D band pass filter simulating the pattern of stored transform coefficients by random filtering noise in the frequency domain. By using the technique of the present principles, applicants obtain a set of cut frequencies useful for film grain modeling to enable simulation of film grain for blending into an image to enhance contrast for viewing.

35 U.S.C. 112 Rejection of Claims 6, 7, 10 and 11

Claims 6, 7, 10 and 11 stand rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The examiner contends that these claims contain subject matter not described in the specification. In particular, the examiner contends that the manner in which the intersection points are used to determine the cut frequencies is not described in sufficient detail.

Applicants respectfully traverse the rejection of claims 6, 7, 10 and 11 under 35 U.S.C. 112. Applicants' specification at pages 5-7 describes the process depicted in flow chart form in FIG. 1 for estimating the low and high vertical cut frequencies (Low_VF and High_VF, respectively) and the low and high horizontal cut frequencies (Low_HF and High_HF, respectively). At Page 7,

lines 1-12, of their specification, applicants discuss in detail the technique for establishing the intersection points. In particular, applicants describe the process of estimating the horizontal cut frequencies by first plotting a vector $\mathbf{B'}_H$ as a curve and then obtaining the intersection with the average value of $\overline{B}'_H$. The component(s) of $\mathbf{B'}_H$ that intersect with $\overline{B}'_H$ serve as estimates of the horizontal cut frequencies. The vertical cut frequencies are calculated in a similar manner. Applicants specification at page 6 describes the mathematical formulas for calculating the vectors $\mathbf{B'}_H$ and $\mathbf{B'}_V$ as well as the average values $\overline{B}'_H$ and $\overline{B}'_V$. Techniques for plotting the vectors, such as the vectors $\mathbf{B'}_H$ and $\mathbf{B'}_V$ and for determining the intersection points with calculated values, such as $\overline{B}'_H$ and $\overline{B}'_V$, respectively, are well known and do not require further elaboration. Therefore, applicants' specification contains ample written description of how to determine the cut frequencies, thereby rendering claims 6, 7, 10 and 11 in full compliance with 35 U.S.C. 112.

35 U.S.C. 103(a) Rejection of Claims 1, 3 and 12

Claims 1, 3, and 12 stand rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent 7,362.911 to Michel Frank (hereinafter, the "Frank patent" in view of US Patent 6.027,125 to William H. May (hereinafter, the "May patent"). In rejecting these claims, the examiner contends that the Frank patent discloses a method for automatically modeling patterns, and specifically, transforming firm grain patters to the frequency domain. In particular, the examiner contends that Frank teaches the step of "applying a 2D low pass filter with a "cut-off" frequency close to the upper coefficients."

The examiner concedes that Frank patent does not disclose modeling of film grain patterns or specifically transforming a set of film grain samples. To overcome that deficiency of Frank, the examiner relies on the May patent, asserting that this reference teaches modeling of film grain patterns. Therefore, the examiner contends it would have been obvious to combine the teachings of the Frank and May patents.

Applicants take issue with the rejection for several reasons. First, applicants submit that the Frank patent does not constitute a valid reference

because its critical date, as provided in 35 U.S.C. 102(e), is its US filing date of 13 November 2003 whereas applicants' application claims priority to US Provisional Application 60/498,945 filed 28 February 2003. Since applicants' priority date predates the Frank patent, the examiner's rejection of claim 1 in reliance on the Frank patent al. must fail.

Assuming arguendo that the Frank patent constitutes a timely reference, the examiner's reliance on the Frank reference is misplaced for several reasons. While applicants agree that the Frank patent discloses a technique for noise modeling, Frank's employs such noise modeling to **subtract** a certain amount of pixel noise present in a frame of image data based on a confidence estimate. In contrast, applicants model the entire amount of film grain in an image. In this regard, the Frank patent teaches the use of a confidence estimate to **limit** the value of the predicted noise value. Thus, a skilled artisan making use of the modeling technique of Frank would not obtain a model of the full amount of film grain. Therefore using the noise reduction model of Frank to model film grain for blending into an image would yield unsatisfactory results.

Further, applicants take issue with the examiner's contention that the Frank patent teaches applicants claimed feature of:

> estimating the cut frequencies of a 2D band-pass filter that can effectively simulate the pattern of transform coefficients by filtering random noise in a frequency domain.

In arguing that the Frank patent teaches the above-described feature of applicants' claims 1, 3 and 12, the examiner relies on the disclosure at Col. 5, lines 30-60 of Frank. The only discussion in the Frank patent concerning a 2-D filter, and its associated cut-off frequencies, appears at Col. 5, lines 50-60 which applicants have reproduced below:

> Multiplying the 8 x 8 coefficients by a 2-D weighting matrix is equivalent to applying a 2-D filter in spatial space. Assuming that fine-grain texture is represented by the plurality of high frequency coefficients, applying a 2-D low-pass filter with a "cut-off" frequency close to the upper coefficients, such as the upper two coefficients, would leave the texture of the pixel block pretty much intact but filter out the noise components which fluctuate from pixel to pixel. As a result, the noise components of the pixel block that made up of the "high frequency" content can be calculated and removed from measured pixel values to derive the predicted pixel values.

While applicants agree that the Frank patent discloses the use of a 2-D filter, the patent says nothing about **estimating the cut-frequencies to simulate the pattern of transform coefficients.** At best, Frank teaches filtering a matrix of transform coefficients with a 2-D filter having a cut-off frequency close to the upper coefficients already known. Such disclosure in Frank does not constitute the same activity as estimating cut frequencies to simulate coefficients. Therefore, the Frank patent would not teach all of the steps of applicants' claims 1, 3 and 12.

With regard to film grain modeling, the May patent refers to an article "Estimation of Images degraded by Film Grain Noise" by E. Naderi et al. That article proposes a model that makes use of a formula wherein the observed pixel value (y) constitutes the sum of the pixel value (X) and the product of the pixel value (X) and a random noise variable having a Gaussian or normal distribution. The model disclosed in the May patent does not make use of any of the steps recited in applicants' claims 1 and 12. Specifically, the model does not employ the step of transforming a set of film grain samples into the frequency domain.

In rejecting applicants' claims 1, 3 and 12, the examiner contends that it would be obvious to make use of the film grain model of May in the noise simulation technique of Frank. However, the May patent does not teach or suggest a film grain simulation technique that relies on transforming film grain samples into the frequency domain. While Frank teaches the desirability of using a Discrete Cosine Transform or Fast Fourier Transform for predicting pixel values, the patent says noting about using a DCT or FFT to transform **film grain samples** into the frequency domain. Indeed, the examiner has conceded as much.

Assuming the examiner properly applies the May patent, with all its teachings, with the Frank patent, applicants submit that the film grain model of May (which does not make use of any type of transform) is incompatible with the Frank patent (which teaches the need to use a transformation) thus rendering the examiner's proposed combination improper. To rely on the May patent to teach film grain modeling with out regard to the mechanism the patent discloses for performing such modeling, would violate the tenant that "it is impermissible within the framework of 35 U.S.C. 103(a) to pick and choose from any one reference

only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." *In re Wesslau,* 353 F.2d 238, 241 (1965).

Given the impropriety of the examiner's combination of the Frank and May patents, the 35 U.S.C. 103(a) rejection of claims 1, 3 and 12 fails. Therefore, applicants request withdrawal of the 35 U.S.C. 103(a) rejection of these claims.

35 U.S.C. 103(a) Rejection of Claim 2

Claim 2 stands rejected under 35 U.S.C. 103(a) as obvious over the combination of the Frank and May patents, as discussed above, further in view of U.S. Published Patent Application 2007/002947 to Lu et al. Applicants respectfully traverse the rejection for two reasons.

Claim 2 depends from claim 1 and further recites the step of transmitting the cut-frequency in a Supplemental Enhancement (SEI) message. In rejecting claim 1, the examiner relies on the previously discussed combination of the Frank and May patents to teach all of the features of Claim 1. Further, the examiner relies on the Lu et al., which teaches the use of an SEI message to carry filter application information as suggesting the desirability of using SEI message to carry the cut frequency information as recited in claim 2.

In addition to the Frank patent as being inapplicable by virtue of its later filing date, the Lu published application likewise does not constitute a valid reference because its critical date, as provided in 35 U.S.C. 102(e), is its PCT filing date of 18 February 2004 whereas applicants' application claims priority to US Provisional Application 60/498,945 filed 28 February 2003. Therefore, the examiner's rejection of claim 2 in reliance on both the Frank and Lu et al. references must fail.

Assuming arguendo that the Frank and Lu et al. reference are timely, the rejection of claim 2 fails because of the impropriety of the examiner's proposed combination of the Frank and May patents as discussed above. The Lu et al. patent, which concerns itself with a picture coding method that makes use of a filtering process, says nothing about film grain simulation whatsoever. Thus, combining the teachings of Lu et al. with the Frank and May patents teachings would do nothing to render the film grain modeling technique of May suitable with

the noise reduction technique of Frank. Accordingly, applicants request withdrawal of the 35 U.S.C. 103(a) rejection of claim 2.

35 U.S.C. 103(a) Rejection of Claims 4 and 8

Claims 4 and 8 stand rejected under 35 U.S.C. 103(a) as obvious over the combination of the Frank and May patents, as discussed above, further in view of U.S. Published Patent Application 2002/2007/002947 to Engledrum et al. and U.S. Patent 6,327,391 to Shinji Ohnishi et al. Applicants respectfully traverse the rejection.

Applicants' claims 4 and 8 ultimately depend from claim 1 and each further describes the step of analyzing the pattern created by the transform coefficients. In rejecting these claims, the examiner relies of the combination of Frank and May to teach all of the features of claim 1. The examiner relies on the Engledrum et al. published application to teach applicants steps of: (a) computing a mean block of N x N transform coefficients; (b) defining horizontal mean vectors and (c) representing the vectors and separate curves. Further, the examiner relies on the Onishi et al. patent to teach establishing cut-off vectors from mean vectors.

The examiner's proposed combination fails for several reasons. First, as discussed above, the Frank patent does not constitute a proper reference because its critical date, as provided in 35 U.S.C. 102(e), is its US filing date of 13 November 2003 whereas applicants' application claims priority to US Provisional Application 60/498,945 filed 28 February 2003.

Secondly, as discussed above, even if the Frank patent were timely, the examiner cannot properly combine the Frank and May patents because the film grain simulation technique of May is simply incompatible with the noise reduction technique of Frank. Neither the Engledrum et al nor Ohnishi et al. references says anything about film grain simulation and thus combining their teachings would do nothing to overcome the aforementioned incompatibility of the Frank and May patents. Therefore, applicants claims 4 and 8 patentably distinguish over the art of record and applicants request withdrawal of the 35 U.S.C. 103(a) rejection of these claims.

35 U.S.C. 103(a) Rejection of Claims 5 and 9

Claims 5 and 9 stand rejected under 35 U.S.C. 103(a) as obvious over the combination of the Frank, May, Engledrum et al. and Shinji Ohnishi et al. references further in view of U.S. Patent 6,285,711 to Krishna Ratakonda et al. Applicants respectfully traverse the rejection.

Applicants claims 5 and 9 each depend from claims 4 and 8, respectively and further recite the step of low pass filtering at least one mean vector, In rejecting these claims, the examiner relies of the combination of Frank, May, Engledrum et al., and Oshini et al. to teach the features of claims 4 and 8. The examiner relies on the Ratakonda et al. patent to teach low pass filtering

The examiner's proposed combination fails for several reasons. First, as discussed above, the Frank patent does not constitute a proper reference because its critical date, as provided in 35 U.S.C. 102(e), is its US filing date of 13 November 2003 whereas applicants' application claims priority to US Provisional Application 60/498,945 filed 28 February 2003.

Secondly, as discussed above, even if the Frank patent were timely, the examiner cannot properly combine the Frank and May patents because the film grain simulation technique of May is simply incompatible with the noise reduction technique of Frank. None of the Engledrum et al, Ohnishi et al., nor Ratakonda et al. references says anything about film grain simulation and thus combining their teachings would do nothing to overcome the aforementioned incompatibility of the Frank and May patents. Therefore, applicants claims 5 and 9 patentably distinguish over the art of record and applicants request withdrawal of the 35 U.S.C. 103(a) rejection of these claims.

Conclusion

In view of the foregoing amendments to the claims and the accompany remarks, applicants solicits entry of this amendment and allowance of the claims. If the Examiner cannot take such action, the Examiner should contact the applicant's attorney at (609) 734-6820, to schedule a mutually convenient date and time for a telephonic interview

No fees are believed due with regard to this Amendment. Please charge any fee or credit any overpayment to Deposit Account No. **07-0832.**

Respectfully submitted,
Cristina Gomila, et al.

By: _____

Robert B. Levy
Attorney for Applicants
Reg. No. 28,234
Phone (609) 734-6820

Patent Operations
Thomson Licensing LLC
P.O. Box 5312
Princeton, New Jersey 08543-5312

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